

(21)(A1) 2,283,594

(22) 1999/09/09

(43) 2001/03/09

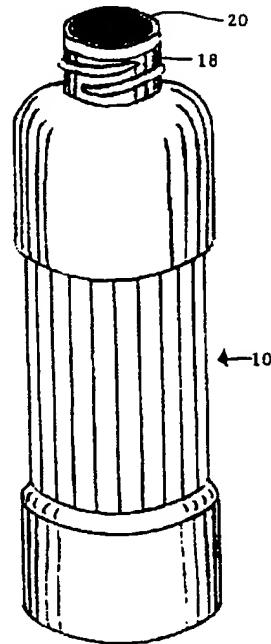
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(51) Int.Cl.⁶ A01M 21/04, B05C 1/06

(54) APPAREIL DE TRAITEMENT A HERBICIDE PAR CONTACT

(54) ON CONTACT HERBICIDE APPLICATOR



(57) Prior on contact herbicide applicators were generally too large to selectively apply herbicide to weeds without also getting herbicide on closely adjacent desired vegetation, they also generally did not allow the User to see where herbicide had been applied. In the instant invention a herbicide container suitable for single hand operation is filled with a combination of liquid herbicide and a weed colouring element. The top end of the herbicide container has a herbicide release head that prevents the liquid herbicide and colouring element mixture from being released until suitable pressure is applied to it. The herbicide container is relatively small, therefore the User is able to rub the herbicide release head on weeds while avoiding desired vegetation. The colouring element allows the User to see where herbicide was applied.

Abstract of the Specification

Prior on contact herbicide applicators were generally too large to selectively apply herbicide to weeds without also getting herbicide on closely adjacent desired vegetation, they also generally did not allow the User to see where herbicide had been applied. In the instant invention a herbicide container suitable for single hand operation is filled with a combination of liquid herbicide and a weed colouring element. The top end of the herbicide container has a herbicide release head that prevents the liquid herbicide and colouring element mixture from being released until suitable pressure is applied to it. The herbicide container is relatively small, therefore the User is able to rub the herbicide release head on weeds while avoiding desired vegetation. The colouring element allows the User to see where herbicide was applied.

ON CONTACT HERBICIDE APPLICATOR

Background of the Invention

Field of the Invention

The present invention relates in general to contact herbicide applicators and more particularly to hand-held contact herbicide applicators.

Description of Related Art

Many devices have been invented to apply herbicides to weeds. A common prior art manner of applying herbicide is to spray it on the weeds. Spraying is both fast and effective, however, it is not selective. All vegetation within the spray area is at least partially covered by the herbicide. Therefore, a spray herbicide is not a practical means of killing weeds that are closely interspersed within desired plants.

Another prior art means of applying herbicide is through contact herbicide applicators. A contact herbicide applicator is one in which an applicator head area must come into contact with the vegetation on which the herbicide is to be dispensed. The contact herbicide applicators which are known to the inventor have one or both of the following characteristics, a large size and/or a complex mechanism.

The disadvantage to a large sized contact herbicide

applicator is that it is difficult to use in close quarters. In other words, when a person has an area of vegetation in which the distances between the weeds and the desired vegetation is minimal, it is very difficult to use a herbicide applicator that is many times larger than the spacing between the desired vegetation and the undesired weeds, if the User is simultaneously trying to make herbicide dispensing contact with the weeds yet avoid the desired vegetation.

There are three disadvantages to a complex mechanism on contact herbicide applicator. Firstly, anything that is complex is relatively expensive to produce. Secondly, a complex device is more difficult to produce than is a simple device. Thirdly, a more complex device is more prone to failure than is a simple device.

A fourth disadvantage to most of the prior art on contact herbicide applicators of which the inventor is aware is that they do not allow the User to track the herbicide as it is being applied.

Summary of the Invention

An object of the present invention was to design a herbicide applicator that was small enough to be able to effectively apply herbicide to weeds that were in very close proximity to desired vegetation, and at the same time avoid getting the herbicide on the desired vegetation.

A second object of the present invention was to

design a herbicide applicator that was relatively simple to construct.

A third object of the present invention was to design a herbicide applicator that would allow the User to track the applied herbicide.

The objects of the invention are accomplished by constructing an on contact herbicide applicator that is comprised of: a herbicide container of a length and diameter which allows it to be easily held and used with one hand, wherein the top end of the herbicide container is in the shape of an open neck; and which is further comprised of a herbicide release means which can be sealingly inserted into the neck of the herbicide container and once so inserted, if suitable pressure is not applied to the herbicide release means, then the herbicide release means will prevent liquid that is within the herbicide container from being released through the neck of the herbicide container, and if suitable pressure is applied to the herbicide release means, then the herbicide release means will allow liquid that is within the herbicide container to flow out through the neck of the herbicide container; and which is further comprised of a liquid herbicide; and which is further comprised of a weed colouring element that will mix with the liquid herbicide.

There are many advantages to the invention. The initially obvious advantages to the present invention that will be clear to those skilled in the art to which this invention pertains is that it is simple to construct, and it

does not require the complex mechanisms which many of the prior art contact herbicide applicators rely on for their operation.

A further advantage to the present invention is that it is small and maneuverable by a single hand; accordingly, it can be used to apply herbicide to weeds that are in close proximity to desired vegetation with little risk of accidentally getting the herbicide on the desired vegetation.

A further advantage to the present invention is that the weed colouring element which is mixed with the herbicide will allow the User to keep track of which weeds have had herbicide applied to them, and where on them it was applied.

Brief Description of the Drawings

Figure 1 is a perspective view of an embodiment of an on contact herbicide applicator of the present invention which uses a liquid permeable applicator head to transmit the herbicide;

Figure 2 is a cross section of the embodiment of figure 1;
Figure 3 is an exploded perspective view of a head portion suitable for the embodiment shown in figure 1;

Figure 4 is an exploded perspective view of an alternate head portion suitable for the embodiment shown in figure 1;

Figure 5 is a perspective view of another embodiment of an on contact herbicide applicator of the present invention, which uses a ball and socket assembly to

transmit the herbicide;

Figure 6 is a cross section of the embodiment of figure 5;
Figure 7 is an exploded perspective view of the head portion
of the embodiment shown in figure 5;

Figure 8 is a perspective view of another embodiment of an
on contact herbicide applicator of the present
invention, which uses a ball and socket assembly to
transmit the herbicide.

Description of the Preferred Embodiments

The preferred embodiment of an on contact herbicide applicator of the present invention, which is illustrated in figures 1, 2, and 3 is made up of a herbicide container, bottle 10, a bottle neck closure housing 12, a piece of disc shaped absorbent material 20, a seating ring, which is not illustrated, a spring action release valve 17, a liquid herbicide, which is not illustrated, and a weed colouring element, which is not illustrated, and a screw on cap 11. In the preferred embodiment the weed colouring element is a liquid dye that mixes relatively homogeneously with the liquid herbicide.

In place of a liquid dye any colouring element capable of colouring weeds can be used as long as it will mix with the liquid herbicide.

The bottle 10 would typically be made out of a low cost plastic which is suitable for holding herbicide. The specific shape of the bottle shown in figures 1, 2, 5, 6 and

8 is not an essential feature of the invention; however, the shape of bottle 10 is the shape that the inventor considers as the preferred shape for the bottle.

The absorbent material 20 can be a woven cloth, or a foam material, or any other material that absorbs liquid at a suitable rate such that it will become saturated during normal use of the invention at a rate that is complimentary to the rate at which an anticipated User will be applying the herbicide/weed colouring element to the weeds. Thereby an approximate dynamic equilibrium will be maintained between the rate at which the liquid is absorbed (from within the bottle 10) by the absorbent material such as at 20 and the rate at which the liquid is dispensed to the outside of the bottle by the absorbent material such as at 20. The result of such a dynamic equilibrium is that the on contact herbicide applicator of the present invention will tend not to drip herbicide onto vegetation to which herbicide was not intended to be applied during normal use of the invention. Alternatively, as illustrated in figure 4, a material such as a fine sponge 21, or other easily saturatable material can be used in combination with a fibrous diaphragm 22. The combination of the fine sponge or other easily saturatable material together with the fibrous diaphragm will yield a combined saturation rate that is similar to the saturation rate of the absorbent material 20.

The spring action release valve 17 is a standard type, made up of: a cone shaped head terminating at its top end in

an aperture 17a, and terminating at its bottom end in an opening the outer edge of which is 17c; a valve, not shown, that is fitted within the cone shaped head below the aperture 17a, that can seal off the aperture; and a spring that depends down from the valve terminating in a bottom coil 17b. The spring controls the valve. The spring puts pressure on the valve causing it to seal off the aperture 17a. However, if sufficient pressure is exerted against the top end of the cone shaped head to cause the spring to become sufficiently depressed, then the spring ceases to maintain the valve in a closed position, thereby allowing liquid to pass from the inside of the cone shaped head out through aperture 17a.

The neck closure housing 12, as illustrated in figures 2 and 3 has a hollow cylindrical body 13, a top end 14 with an outer annulus 14a, a central aperture 15, and at its bottom end an inner lip 16 which defines its bottom opening. The diameter of the opening defined by the inner lip 16 is smaller than is the diameter of the bottom 17b of the spring action release valve 17. The aperture 15 in the top 14 of the neck closure housing 12 is of approximately the same diameter as the aperture 17a in the top of the spring action release valve 17.

The outer diameter of the hollow cylindrical body 13 is such that it can sealingly fit within the neck 18 of the bottle 10. The inner diameter of the hollow cylindrical body 13 is of such a diameter that the outer edge 17c of the cone shaped head of the spring action release valve 17 sealingly

fits within the inner wall of the body 13 of the bottle neck closure housing 12.

The spring action release valve 17 is a standard type. It is angularly inserted into the bottle neck closure housing 12 from the bottom. Once inserted, and vertically aligned with the interior of the body 13 of the bottle neck closure housing 12, the outer edge 17c of the cone shaped head of the spring action release valve 17 sealingly sits within the inner wall of the body 13 of the bottle neck closure housing 12; and the bottom 17b of the spring action release valve 17 sits on the inner lip 16. Under normal use the bottom 17b will not pass through the opening defined by inner lip 16. A standard spring action release valve 17 maintains closed its top aperture 17a, not allowing liquid to pass through it, until sufficient pressure is exerted against the top to depress the spring at which time the valve portion of the spring action release valve opens to permit liquid to pass through aperture 17a. Once the pressure is removed from the top of the spring action release valve the spring again causes the valve to close off the top aperture 17a.

After the spring action release valve 17 has been inserted within and vertically aligned with the interior of the body 13 of the bottle neck closure housing 12, the bottle neck closure housing 12 is press fit within the neck 18 of the bottle 10. It is not an essential feature of the invention that the closure housing be able to be press fit within the neck of the bottle. A screw in neck closure

housing could be used if the inside of the neck of the bottle was screw threaded. Any means by which the housing becomes sealingly held within the neck of the bottle will suffice. However, it is the preferred method to use a housing that sealingly press fits into the neck.

The preferred method of assembling the invention illustrated in figures 1, 2 and 3, is to pour the herbicide and the weed colouring element into the bottle 10, through the opening 19 in the neck 18. Then to angularly insert the spring action release valve 17 into the bottle neck closure housing 12. The bottle neck closure housing 12 is then sealingly press fit within the neck 18 of the bottle 10. The disc shaped absorbent material 20 is then placed onto the top 14 of the neck closure housing 12 and held in place by a seating ring, which is not shown, that is snap fit into the annulus 14a of the neck closure housing 12. The cap 11 is then screwed onto the neck 18.

To use the invention the cap 11 is removed, the bottle 10 is tilted so that the internal liquid can flow towards the top end of the bottle 10, and the disc shaped absorbent material 20 is pressed and rubbed against the weed.

The embodiment of the invention illustrated in figures 5, 6, 7 and 8 is made up of a herbicide container, bottle 10, a bottle neck closure housing 25, a ball 23, a liquid herbicide, which is not illustrated, a weed colouring element, which is not illustrated, and a screw on cap 11. The bottle neck closure housing 25 has an opening 28 in its top

end which defines a socket with a top inner edge 29 and a bottom inner edge 30. The diameter of the ball 23 is greater than is the diameter of the opening defined by the top inner edge 29, and greater than is the diameter of the opening defined by the bottom inner edge 30. However the diameter of the ball 23 is such that the ball 23 can, by the application of pressure that will not damage the ball or the edges 29 or 30, be snap fit between the edges 29 and 30. The distance between inner edges 29 and 30 is such that the diameter of the cross section of ball 23, at the point at which the ball 23 will naturally rest against the bottom inner edge 30, when the bottle 10 is vertical and right side up, is minutely less than is the diameter of either inner edge 29 or 30. The distance between inner edges 29 and 30 is such that the diameter of the cross section of ball 23, at the point at which the ball 23 will naturally rest against the top inner edge 29, when the bottle 10 is vertical and upside down, is minutely less than is the diameter of either inner edge 29 or 30.

The preferred method of assembling the invention illustrated in figures 5, 6, 7, and 8, is to pour the herbicide and the weed colouring element into the bottle 10, through the opening 19 in the neck 18 of the bottle 10. Then to snap fit the ball 23 within the inner edges 29 and 30 of the bottle neck closure housing 25. The bottle neck closure housing 25 is then sealingly press fit within the neck 18 of the bottle 10. The cap 11 is then screwed onto the neck 18.

To use the invention the cap 11 is removed, the bottle 10 is tilted so that the internal liquid can flow towards the top end of the bottle 10, and the ball 23 is pressed and rubbed and thereby rolled against the weed. When the bottle 10 is tilted so that the internal liquid can flow towards the top end of the bottle 10, and the ball 23 is pressed and rubbed and thereby rolled against a weed, the ball will roll within its socket, defined by inner edges 29 and 30, and seal against the downward inclined portion of either or both of inner edges 29 and 30. Thereby liquid from inside the bottle will be transmitted by the ball's surface to the surface which the ball is being rubbed and thereby rolled against, and liquid will not significantly drip out of the downward inclined portion of the top end of the bottle.

The screw on cap 11 is not an essential feature of the invention, however, in any preferred embodiment of the invention there would be a means of closing off the top of the on contact herbicide applicator. In the figures 1, 2, 3, 4 and 7 embodiments, a screw on cap is used to close off the top of the on contact herbicide applicator. Another closure means could be a snap shut lid such as the one illustrated at 31 of figure 8. In figure 8 the lid is hinged to the edge of the top of the bottle neck closure housing 25. Alternatively a snap on/snap off lid could be completely removable from the herbicide applicator. In any case a means to seal the herbicide release means from the surrounding air, when it is not in use, is preferred, though not an essential element of

the invention.

A clear advantage to any construction of the invention is that the on contact herbicide applicator of the present invention is small enough to apply herbicide to most weeds without getting any herbicide on even very close desired vegetation. A second advantage is that the invention, in all of its embodiments is simple to construct, and relative to most (if not all) of the prior art, will be inexpensive and quick to construct out of commonly available materials. That fact alone presents an obvious tremendous advantage (i.e. relatively low cost and easy and ready access to the necessary materials). Another very significant advantage is that it allows the User to keep track of which weeds have had herbicide applied to them, and where on them it was applied. Users of this invention will normally be applying herbicide to weeds that are in very close proximity to desired vegetation, and in areas where the quantity of weeds makes it impractical to pull out the weeds by hand. Hence there will be a lot of weeds closely mixed with a lot of desired vegetation. Accordingly, after a few dozen weeds have been treated it would normally be very easy for the User to forget which weeds had already been treated and which still needed treatment. However, as the weed colouring element allows the User to see where the herbicide has been applied, the User will be able to accurately apply the herbicide to all of the weeds in the area and have a means of ascertaining when he has in fact applied it to all of the weeds.

Variations to the invention can be made, as shown by way of example in the various embodiments illustrated in figures 1 to 8 inclusive; in addition, other variations will be obvious to those skilled in the art, and they are covered by the appended claims, as they are within the scope of the invention.

CLAIMS

The embodiments of the invention in which an exclusive property or privileges is claimed are defined as follows:

1. An on contact herbicide applicator that is comprised of:
 - a.) a herbicide container of a length and diameter which allows it to be easily held in one hand, and easily maneuvered in all directions by one hand, which is suitable for holding liquid herbicide, wherein the upper portion of the herbicide container defines a neck with an opening at its top end that is continuous with the interior of the body of the herbicide container;
 - b.) a herbicide release means which can be sealingly inserted into the neck of the herbicide container and once so inserted, if suitable pressure is not applied to the herbicide release means, then the herbicide release means will prevent liquid that is within the herbicide container from being released through the neck of the herbicide container, and if suitable pressure is applied to the herbicide release means, then the herbicide release means will allow liquid that is within the herbicide container to be released through the neck of the herbicide container;
 - c.) a liquid herbicide; and
 - d.) a weed colouring element that will mix with the liquid herbicide, and which weed colouring element will colour weeds to which it is applied.

2. An on contact herbicide applicator that is comprised of:

a.) a herbicide container of a length and diameter which allows it to be easily held in one hand, and easily maneuvered in all directions by one hand, which is suitable for holding liquid herbicide, wherein the upper portion of the herbicide container defines a neck with an opening at its top end that is continuous with the interior of the body of the herbicide container;

b.) a herbicide release means which can be sealingly inserted into the neck of the herbicide container and once so inserted, if suitable pressure is not applied to the herbicide release means, then the herbicide release means will prevent liquid that is within the herbicide container from being released through the neck of the herbicide container, and if suitable pressure is applied to the herbicide release means, then the herbicide release means will allow liquid that is within the herbicide container to be released through the neck of the herbicide container; which herbicide release means is comprised of:

i.) a neck closure means with a top end having an aperture, a bottom end that defines an opening, and a hollow body that is continuous between the aperture in the top end and the opening defined by the bottom end, and wherein the exterior of the hollow body of the neck closure means is of a diameter, and is constructed of a material, such that it can be sealingly held within the neck of the herbicide container, and wherein the interior diameter of the hollow body is

greater than is the diameter of the opening defined by the bottom end of the hollow body, and wherein the top end of the neck closure means is suitable for having a herbicide transmitting means attached to it;

ii.) a liquid control means which can be inserted into the hollow body of the neck closure means, and once so inserted will be held within the hollow body of the neck closure means by the neck closure means, and wherein if suitable pressure is not applied against the top end of the liquid control means, then the liquid control means will seal the aperture in the top end of the neck closure means such that liquid cannot pass through it, and wherein if suitable pressure is applied against the top end of the liquid control means then the liquid control means will not seal the aperture in the top end of the neck closure means; and

iii.) a herbicide transmitting means that is a liquid permeable material which is attached to the top end of the neck closure means;

c.) a liquid herbicide; and

d.) a weed colouring element that will mix with the liquid herbicide, and which weed colouring element will colour weeds to which it is applied.

3. An on contact herbicide applicator that is comprised of:

a.) a herbicide container of a length and diameter which allows it to be easily held in one hand, and easily maneuvered in all directions by one hand, which is suitable

for holding liquid herbicide, wherein the upper portion of the herbicide container defines a neck with an opening at its top end that is continuous with the interior of the body of the herbicide container;

b.) a herbicide release means which can be sealingly inserted into the neck of the herbicide container and once so inserted, if suitable pressure is not applied to the herbicide release means, then the herbicide release means will prevent liquid that is within the herbicide container from being released through the neck of the herbicide container, and if suitable pressure is applied to the herbicide release means, then the herbicide release means will allow liquid that is within the herbicide container to be released through the neck of the herbicide container; which herbicide release means is comprised of:

i.) a neck closure means with a top end having an aperture, a bottom end that defines an aperture, and a hollow body that is continuous between the aperture in the top end and the aperture defined by the bottom end, and wherein the exterior of the hollow body of the neck closure means is of a diameter, and is constructed of a material, such that it can be sealingly held within the neck of the herbicide container, and wherein the top end of the neck closure means is suitable for having a herbicide transmitting means that is made up of a combination fibrous diaphragm and liquid permeable material attached to it;

ii.) a liquid control means which can be inserted

into the hollow body of the neck closure means, and once so inserted will be held within the hollow body of the neck closure means by the neck closure means, and wherein if pressure is not applied against the top end of the liquid control means, then the liquid control means will seal the aperture in the top end of the neck closure means such that liquid cannot pass through it, and wherein if pressure is applied against the top end of the liquid control means then the liquid control means will not seal the aperture in the top end of the neck closure means; and

iii.) a herbicide transmitting means that is comprised of a fibrous diaphragm and a liquid permeable material that is situated on top of the fibrous diaphragm, and wherein the combination of fibrous diaphragm and liquid permeable material is attached to the top end of the neck closure means;

c.) a liquid herbicide; and
d.) a weed colouring element that will mix with the liquid herbicide, and which weed colouring element will colour weeds to which it is applied.

4. An on contact herbicide applicator that is comprised of:

a.) a herbicide container of a length and diameter which allows it to be easily held in one hand, and easily maneuvered in all directions by one hand, which is suitable for holding liquid herbicide, wherein the upper portion of the herbicide container defines a neck with an opening at its

top end that is continuous with the interior of the body of the herbicide container;

b.) a herbicide release means which can be sealingly inserted into the neck of the herbicide container and once so inserted, if suitable pressure is not applied to the herbicide release means, then the herbicide release means will prevent liquid that is within the herbicide container from being released through the neck of the herbicide container, and if suitable pressure is applied to the herbicide release means, then the herbicide release means will allow liquid that is within the herbicide container to be released through the neck of the herbicide container; and wherein the herbicide release means is comprised of:

i.) a neck closure means with a top end that has an aperture which defines a socket, and wherein the neck closure means can be sealingly held within the neck of the herbicide container; and

ii.) a ball that can be rotatably held within the socket defined by the top end of the neck closure means, wherein the ball is of such a size that it will sealingly press against any area of the socket that it is brought into contact with unless a sufficient force is applied against it to cause it to rotate within the socket;

c.) a liquid herbicide; and

d.) a weed colouring element that will mix with the liquid herbicide, and which weed colouring element will colour weeds to which it is applied.

5. An on contact herbicide applicator as described in claim 1; which is further comprised of a screw on cap, and wherein the neck that is defined by the upper portion of the herbicide container has an external screw thread onto which the cap can be screwed.
6. An on contact herbicide applicator as described in claim 2; which is further comprised of a screw on cap, and wherein the neck that is defined by the upper portion of the herbicide container has an external screw thread onto which the cap can be screwed.
7. An on contact herbicide applicator as described in claim 3; which is further comprised of a screw on cap, and wherein the neck that is defined by the upper portion of the herbicide container has an external screw thread onto which the cap can be screwed.
8. An on contact herbicide applicator as described in claim 4; which is further comprised of a screw on cap, and wherein the neck that is defined by the upper portion of the herbicide container has an external screw thread onto which the cap can be screwed.
9. An on contact herbicide applicator as described in claim 1; which is further comprised of a snap on cap, and wherein the neck that is defined by the upper portion of the

herbicide container is able to retain the snap on cap.

10. An on contact herbicide applicator as described in claim 2; which is further comprised of a snap on cap, and wherein the neck that is defined by the upper portion of the herbicide container is able to retain the snap on cap.

11. An on contact herbicide applicator as described in claim 3; which is further comprised of a snap on cap, and wherein the neck that is defined by the upper portion of the herbicide container is able to retain the snap on cap.

12. An on contact herbicide applicator as described in claim 4; which is further comprised of a snap on cap, and wherein the neck that is defined by the upper portion of the herbicide container is able to retain the snap on cap.

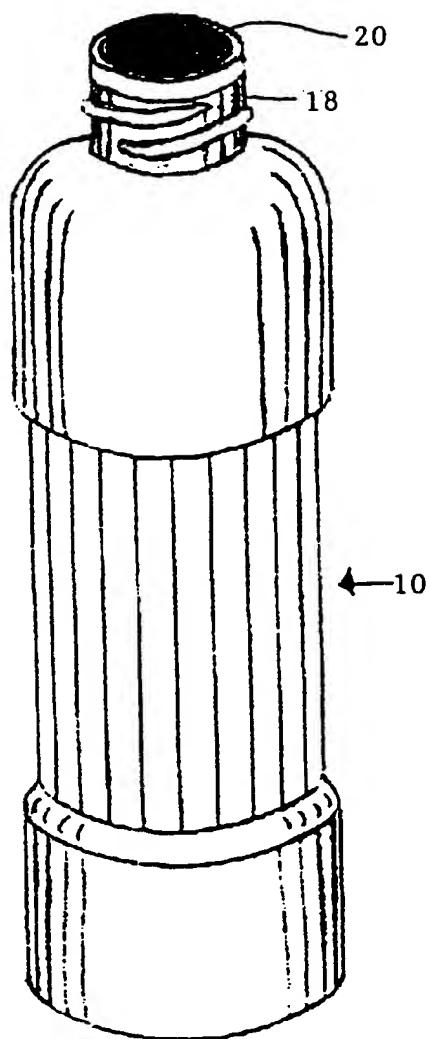


FIGURE 1

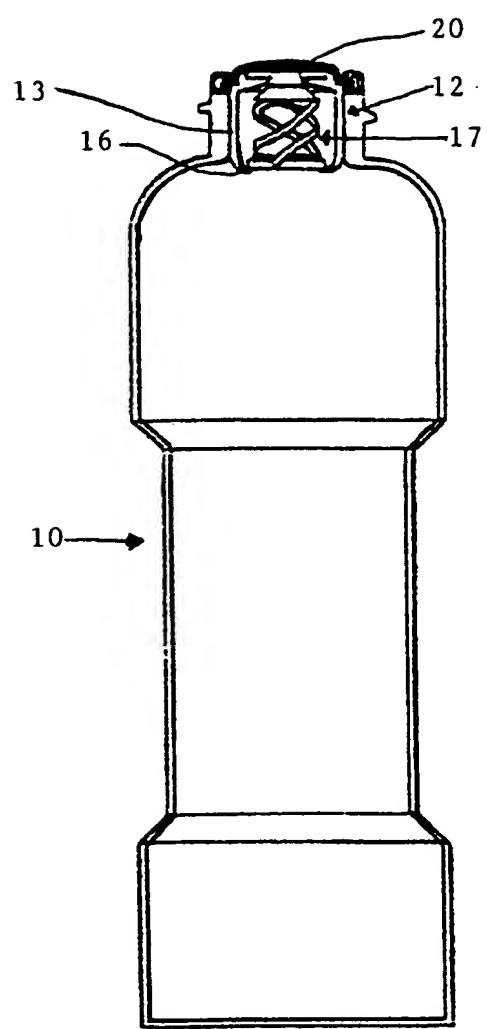


FIGURE 2

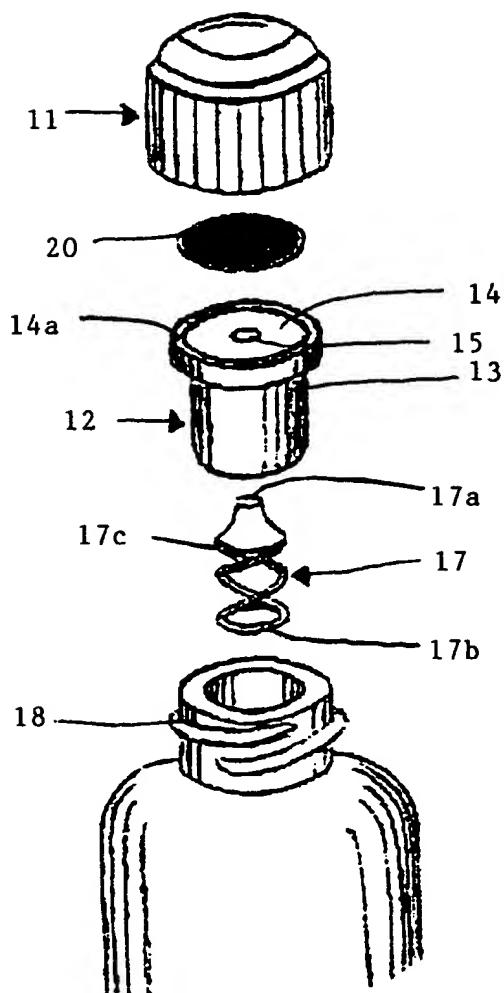


FIGURE 3

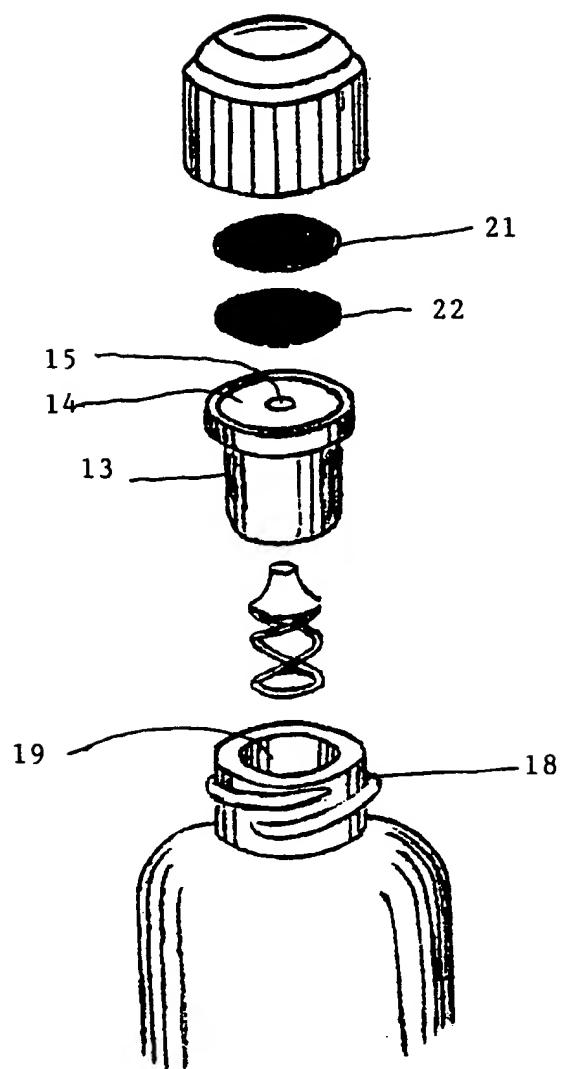


FIGURE 4

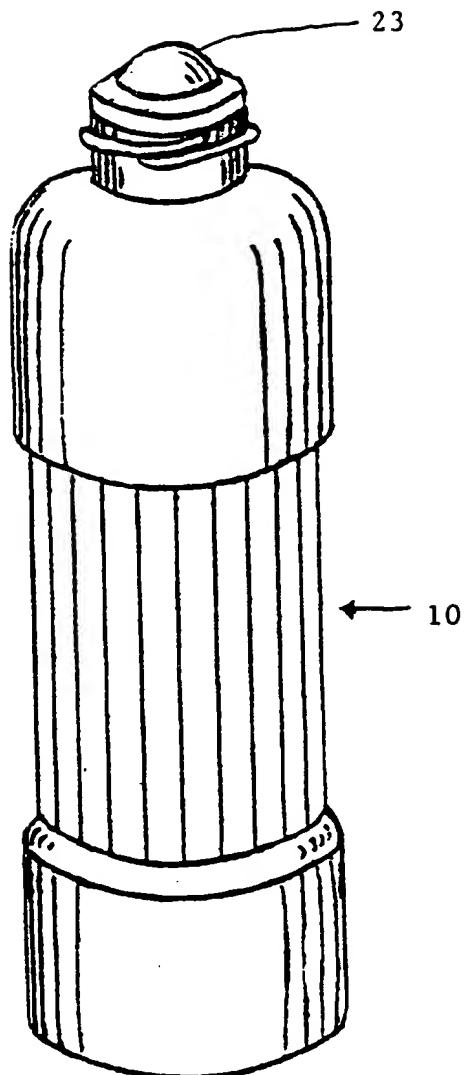


FIGURE 5

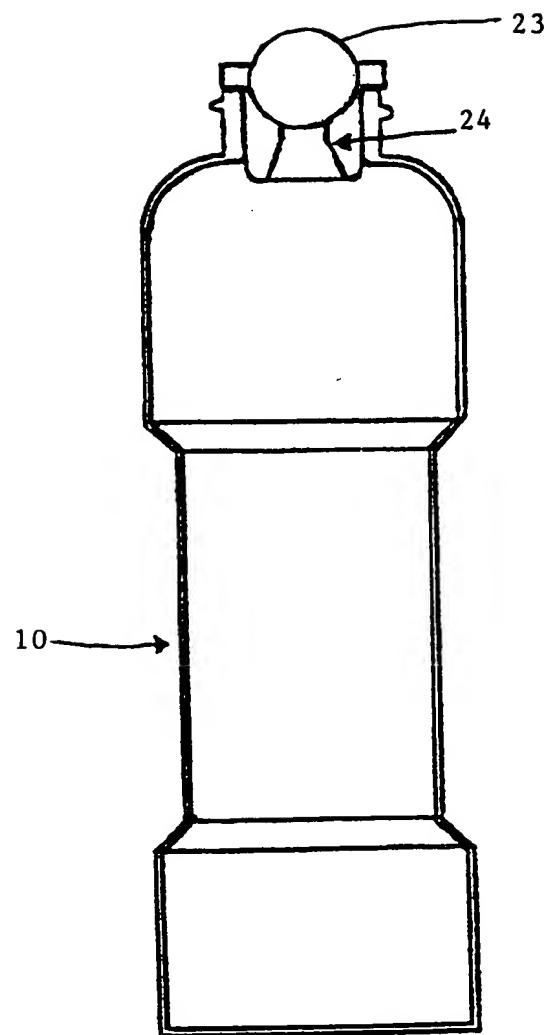


FIGURE 6

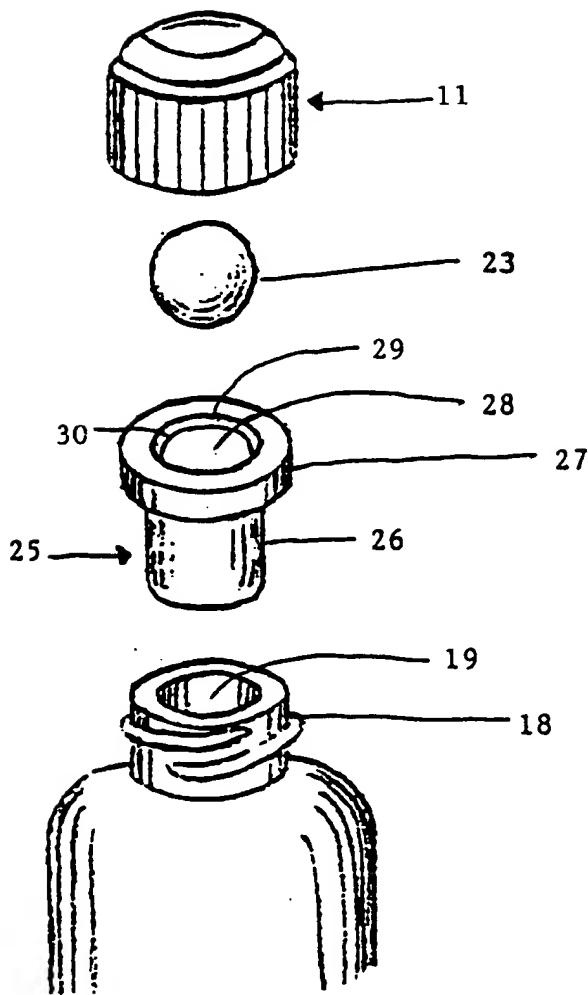


FIGURE 7

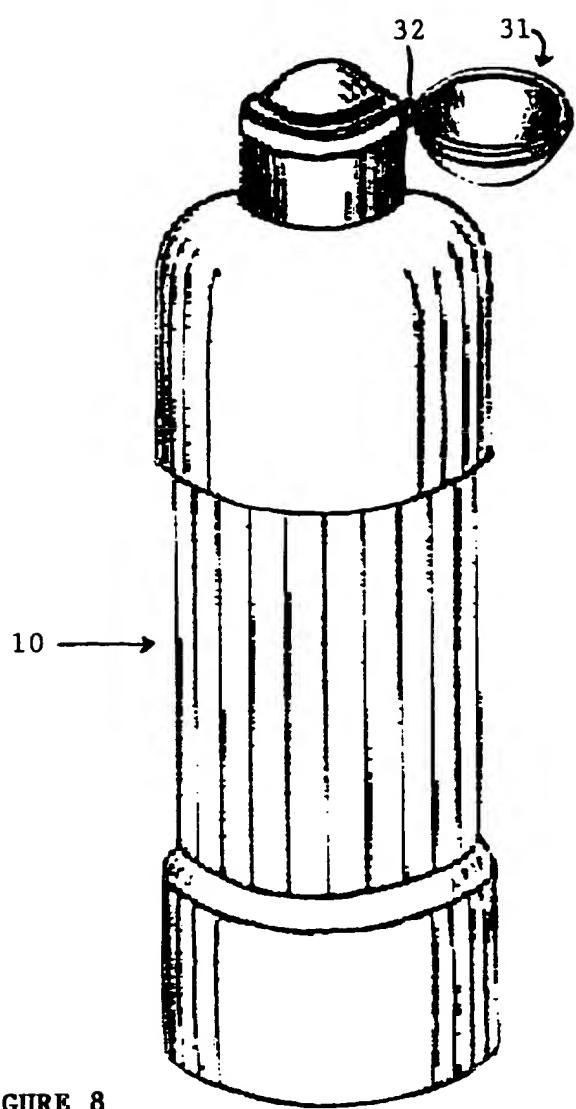


FIGURE 8

